PART II: PLAN IMPLEMENTATION

Part I of the *2007 Water System Plan* presents SPU's water system business "roadmap" for the next six years and beyond. The first chapter of Part II details the anticipated costs of implementing that roadmap through 2030, with a particular focus on the next six years. The second chapter of Part II presents SPU's plan for financing identified operations and capital facilities improvements and priorities in addition to supporting the existing and ongoing costs of SPU's water utility operations.

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Chapter 1
Budget

Seattle City Council

Part I identified a number of needs, gaps, and issues facing SPU in each of its business areas. This chapter focuses on the budget required to implement capital programs and operations and maintenance (O&M) activities to meet SPU's regulatory and customer service objectives, including addressing the needs and gaps identified in Part I of this plan. The first part of the chapter begins by describing SPU's process for developing a capital improvement budget for the water system. Later, the chapter identifies a draft budget for the six-year capital improvement plan (CIP) and 25-year capital facilities plan (CFP) and O&M budget outlook for the water line of business.

1.1 CAPITAL IMPROVEMENT BUDGETING

SPU has made a major commitment to using an asset management approach in selecting which capital improvement projects go forward.

Since the *2001 Water System Plan* was prepared, SPU has made a major commitment to using an asset management approach in selecting which capital improvement projects go forward. Asset management is a method of meeting established and well-defined service levels at a cost that represents the highest life cycle value to the utility and its ratepayers. This may lead to new capital projects or shifts in O&M activities. By adopting an asset management approach, SPU is better able to ensure cost effectiveness in service delivery in the long-run. Key elements of SPU's asset management approach are described below.

1.1.1 Project Development Plan

As described in Part I, evaluation of a proposed capital improvement project for funding begins with preparation of a project development plan (PDP) prepared by the sponsoring business area. The PDP identifies the project's objectives and describes a business and technical strategy for achieving those objectives. Several options for achieving objectives are identified, and then the PDP summarizes the business case for the project, including an analysis of alternative solutions and the net present value of the proposed projects and preferred solution.

1.1.2 Benefit-Cost Analysis

For a capital improvement project to be funded, the PDP for the project must demonstrate that it will provide a positive net present value to SPU and its ratepayers. An improvement's net present value is calculated by identifying all its costs and benefits and, to the extent possible, quantifying them in dollar terms. An appropriate discount rate is used to convert future costs and benefits to equivalent present values. The net present value of a project is the present value of the benefits minus the present value of the costs. Projects which fail to show a positive net present value would not be funded, and in selecting from a number of options to achieve a project's objectives, the one that produces the highest net present value would normally be the option that is preferred.

Alternatively, if a project is required to meet a service level or regulatory requirement, a cost-effectiveness analysis is performed. For these types of projects, the benefits or the value added are equivalent, and the option with the lowest life-cycle costs is preferred.

Life-Cycle Cost Analysis

Life-cycle cost analysis is a process whereby all the capital, operating, social, environmental, and risk costs of a project are analyzed over the expected life of the asset. Costs include the capital cost of acquiring or constructing the improvement or asset, as well as the cost of operating and maintaining the asset over its life cycle.

Triple-bottom-line analysis takes into account financial, social and environmental costs and benefits.

Triple-Bottom-Line Analysis

SPU does not limit its evaluation of projects to just the direct financial aspects. An approach known as triple-bottom-line analyses is applied to assess all of the known and reasonably anticipated economic, environmental, and social impacts of a project (not just those that can be quantified in dollar terms) from a variety of perspectives. SPU has developed a *Triple Bottom Line Guidebook* to standardize this analytical approach and provide techniques for determining values for the social and environmental costs and benefits that are often difficult to quantify in dollar terms. The value modeling used in the Water Supply Planning Model (described in Part I) is an example of a method used by SPU to evaluate costs and benefits that cannot be put into dollar terms.

Risk Costs

The presence of risk can make benefit/cost analysis more complicated. Risk cost is a special cost category that quantifies exposure to uncertain or probabilistic costs, such as those which could potentially arise from the failure of an asset. Risk is calculated as the product of the probability of the risk event times the consequence cost of the event. Risk cost is expressed as an annual cost by using the annual probability multiplied by consequence. It can then be handled like other project costs in the benefit-cost analysis.

1.1.3 Asset Management Committee Review

Projects or programs that are projected to cost $250,000 or more over their life, considering both capital and O&M costs, must be reviewed by SPU's Asset Management Committee (AMC), which is composed of SPU's Executive Team. Water CIP projects that are estimated to cost less than $250,000 must be reviewed by the AMC for the water line of business.

1.2 BUSINESS AREA ACTIONS AND COSTS

Part I of this *2007 Water System Plan* identifies key actions for each water utility business area over the next six years. Those key actions related to capital projects are recapped below for each business area. An overview of the draft 2007-2012 CIP budget (April 2006), summarized according to business areas, is presented in Table 1-1. The detailed draft CIP is provided as an appendix. CIP cost estimates presented in this plan are preliminary and subject to change as the projects are further developed and analyzed. CIP projects are subject to AMC approval and budget adoption by the Seattle City Council.

Table 1-1. Capital Improvement Program Budget 2007-2012 (April 2006 Draft in thousands of 2006 dollars)

Business Area	2007	2008	2009	2010	2011	2012	Total 2007-2012
Water Resources	9,600	8,400	15,900	18,300	4,600	1,500	58,300
Water Quality and Treatment	26,100	16,300	16,800	6,500	17,800	30,700	114,200
Transmission	3,500	2,500	2,500	2,800	3,500	3,300	18,100
Distribution	29,700	20,600	20,700	20,600	20,600	20,900	133,100
Other	38,900	28,800	20,100	24,900	20,900	12,400	146,000
Total	107,800	76,600	76,000	73,100	67,400	68,800	469,700

1.2.1 Water Resources

Major CIP projects for the Water Resources business area include the following:

- Implement both regional and local water conservation programs such as the 1% Program and the City of Seattle I-63 SO, and measures to achieve the 2011-2030 Regional Conservation Program goals. SPU expects to spend in the range of $1.3 million annually on regional conservation programs, with approximately $550,000 from the capital improvement budget and $750,000 from operation and maintenance funds, assuming that SPU pays 50 percent of the cost of hardware measures to provide incentives for customers.

- Complete remedial work and monitoring improvements to address Cedar moraine safety issues, as appropriate. The draft CIP includes an estimate of $775,000 in 2007-2008 for this work.

- Design and construct flood passage improvements at Landsburg Diversion Dam on the Cedar River. The improvements include replacement of two existing spillway gates with one larger, radial gate and installation of a trash rake system for debris handling. The CIP includes a cost estimate of $2.6 million to complete this work in 2007-2009.

- Evaluate and implement preferred option for delivering water from Chester Morse Lake dead storage during drought emergencies. Options analyzed include modifications to the existing system, construction of a new pump station and discharge pipelines, and tunnel options. Various options for stabilizing the outlet channel are also being evaluated. Assuming construction of a new pump station is selected as the preferred alternative, this project is estimated to cost $27,210,000 and will take approximately five years to complete (2007-2011).

1.2.2 Water Quality and Treatment

Continued implementation of the open reservoir covering/burying program comprises the bulk of the CIP projects in the Water Quality and Treatment business area:

- The Myrtle Reservoir Replacement Project is projected to be substantially complete in 2007 and has a total remaining cost of approximately $7 million.

- The Beacon Reservoir Replacement Project is projected to be substantially complete in 2008 and has a total remaining cost of approximately $29 million.

- The West Seattle Reservoir Replacement Project is estimated to cost $28 million with substantial completion projected for 2010.

- The Maple Leaf Reservoir Replacement Project is estimated to cost $47 million with a projected substantial completion date of 2013.

- Volunteer Reservoir Replacement Project is scheduled for 2015, which is not within the six-year CIP. However, preliminary engineering work for this project is scheduled for 2010 through 2012 and is estimated to cost $1.6 million. Total cost of the project, assuming replacement, is estimated to be almost $19 million. This reservoir may be decommissioned, but additional analysis is required to confirm this action.

- Roosevelt Reservoir is scheduled for decommissioning in 2015 and is not included in the six-year CIP.

1.2.3 Transmission

The major CIP projects identified for the transmission system include the following:

- Implement cathodic protection for transmission pipelines. This is estimated to cost $0.5 million per year in 2007-2012.

- Cover the Control Works surge tanks. This project is estimated to cost $600,000 and is included in the CIP for 2007-2008.

- Complete the Cedar/Tolt optimization study and implement improvements to allow greater flexibility in using water from each source. Projects include completion of Maple Leaf gatehouse piping with a cost estimate of $280,000, and other improvements yet to be identified.

- Recoat and upgrade Myrtle, Richmond Highlands and Beverly Park tanks. The total cost for this work is estimated to be $5.5 million.

1.2.4 Distribution

Several ongoing improvement programs for the distribution system are contained in the CIP. These and other major CIP projects identified for the distribution system include the following:

- Complete Queen Anne Booster Pump Station and Standpipe Replacement Projects. This is estimated to cost $10 million.

- Implement Backbone Pipeline System Seismic Upgrades. Almost $3 million is included in the draft six-year CIP to cover the estimate cost of these upgrades.

- Reline or replace aging water mains and improve pressures and fire flows where cost-effective. The draft six-year CIP includes more than $5.5 million per year for this work.

- Extend water mains to new developments. The draft six-year CIP includes approximately $1 million per year for this work.

- Relocate water mains impacted by other projects (large and small) and upgrade water mains in redevelopment areas. This work includes water system improvements and enhancements required for major projects by other agencies, such as the Alaskan Way Viaduct and seawall. The draft six-year CIP includes more that $18 million for these types of projects.

- Replace leaking service connections and install new services. The draft six-year CIP includes approximately $10 million per year for this ongoing work.

- Replace meters. The draft six-year CIP includes more than $600,000 per year for this ongoing work.

1.2.5 Other Water Utility Capital Projects

In addition to the major projects discussed in this water system plan and summarized above, SPU has identified a number of other water system capital projects to be implemented over the next six years. These projects include those in the Major Watersheds business area, such as roads and bridge improvements in the watersheds. Projects involving more than one business area yet

important for achieving the overall goals of the drinking water utility are also included here. These other projects and their costs are listed in Table 1-2.

Table 1-2. Other Capital Projects and Six-Year CIP Costs (April 2006 Draft in thousands of 2006 dollars)

Capital Improvement Program Projects	Costs (April 2006 Draft in thousands of 2006 dollars)						
	2007	2008	2009	2010	2011	2012	Total
Major Watersheds	20,000	14,200	4,900	4,900	3,400	3,000	50,400
Regional Facility Improvements	2,000	2,100	3,300	2,800	1,700	1,200	13,100
Seattle Facility Improvements	1,700	1,700	2,400	800	400	300	7,300
Tank/Standpipe Site Remediation	200	200	10	30	0	0	440
Water Design Standards	300	300	0	0	0	0	600
Heavy Equipment Purchase	3,300	1,500	1,500	4,200	4,000	1,000	15,500
SCADA System	4,100	1,600	1,100	5,300	4,500	25	16,625
System-Wide Security Improvements	1,900	1,00	1,200	1,200	1,200	1,200	8,100
Information Technology	5,600	5,800	5,700	5,700	5,700	5,700	34,200
Total	39,100	28,800	20,110	24,930	20,900	12,425	146,265

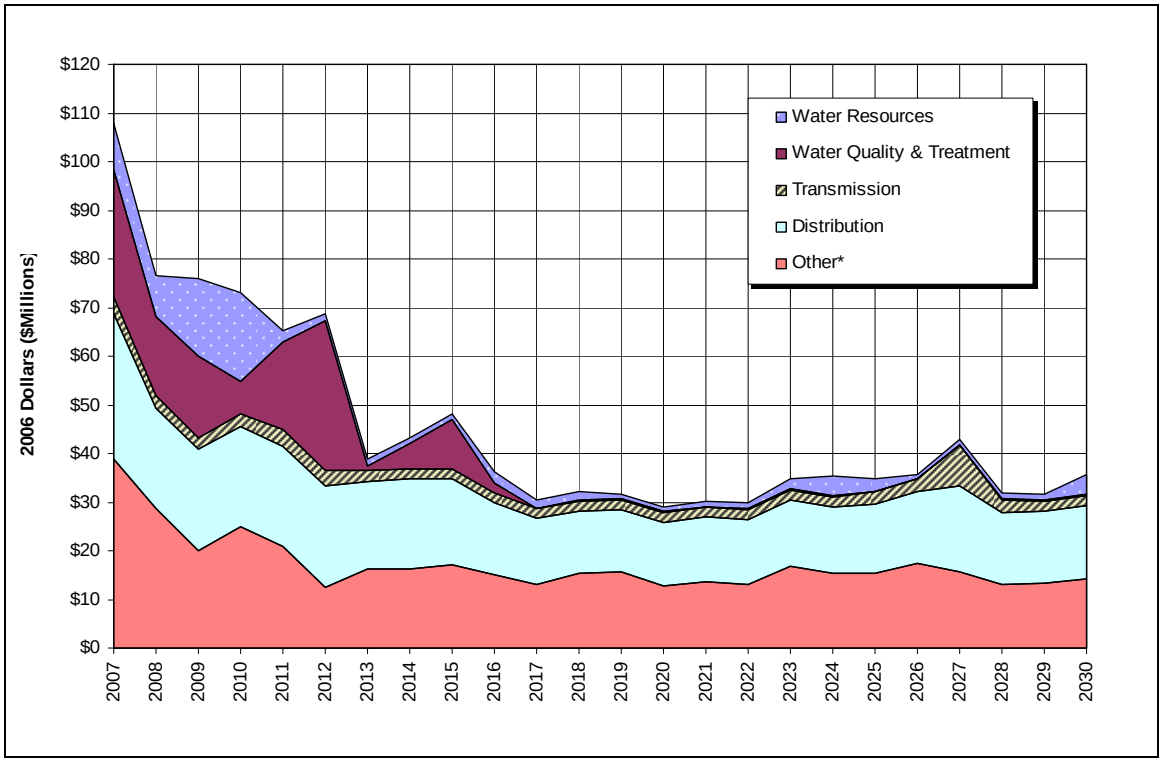
1.3. LONG-RANGE CAPITAL FACILITIES PLAN BUDGET

In addition to developing the six-year capital improvement program summarized above, SPU has developed its best estimate of a Capital Facilities Plan (CFP) budget through 2030, given what is known and anticipated at this time. Beyond 2012, the range of uncertainty in project costs and timing is greater. While projections are shown through 2030, experience has shown that new requirements emerge and projections change over time. The CFP budget estimate is provided as an appendix and summarized in Table 1-3. SPU's proposed CFP totals to more than $1 billion for 2007-2030. Approximately one-third of this is to replace aging infrastructure that is anticipated to reach the end of its useful life.

Figure 1-1 graphically represents SPU's long-range CFP budget for the water utility. Capital spending is expected to be highest in the earlier years, primarily due to completion of the reservoir burying program (Water Quality and Treatment) and Chester Morse Lake Dead Storage Facilities Project (Water Resources). Increased expenditures in 2027 are expected due to the recovering of Bitter Lake and Lake Forest Park Reservoirs (Transmission).

Table 1-3. Capital Facilities Plan Budget through 2030
(April 2006 Draft in thousands of 2006 dollars)

Business Area	2007-2010	2011-2015	2016-2020	2021-2025	2026-2030	Total 2007-2030
Water Resources	52,100	9,800	8,000	10,700	8,600	89,200
Water Quality and Treatment	65,700	64,600	2,800	750	750	134,600
Transmission	11,300	13,200	10,100	10,600	17,600	62,800
Distribution	91,600	95,600	67,100	68,400	77,100	399,800
Other	112,600	83,100	71,900	74,300	73,700	415,600
Total	333,300	266,300	159,900	164,750	177,750	1,102,000



* Includes Major Watersheds, Fleets, Facilities, Security, Information Technology, SCADA, Water Design Standards, and other miscellaneous projects.
Note: 2007-2012 CIP estimate from 4/7/06.

Figure 1-1. Proposed Capital Facilities Plan Spending through 2030

SPU's *2001 Water System Plan* included a long-range capital facilities plan for the water utility. That plan covered the period 2001 through 2020. Table 1-4 compares the CFP budget for the 2001 plan with the CFP budget presented in Table 1-3 and Figure 1-1.

Table 1-4. Comparison of Capital Facilities Plan Budget Estimates from 2001 and 2007 *Water System Plans* (in $ millions)

Water System Plan	2007-2010	2011-2015	2016-2020	2021-2025	2026-2030
2001	194	185	174	N/A	N/A
2007	333	264	160	165	178
Increase/(decrease)	139	79	(14)	N/A	N/A

As Table 1-4 shows, SPU has increased its capital spending projections since its *2001 Water Systems Plan Update* primarily due to changes in the reservoir burying program, security investments, and proposed improvement to the Chester Morse Lake dead storage facilities.

1.4 O&M BUDGET OUTLOOK

Water system operating expenses through 2030 are expected to grow slightly faster than the rate of inflation. The most significant increase in projected O&M expenditures is due to anticipated water main repair costs. These costs are necessary to maintain pipes as the distribution system continues to age. All other changes to O&M expenditures are assumed to balance out; anticipated future efficiency gains in O&M practices and methods are assumed to roughly equal other O&M cost increases. After increasing from $60 to $62.5 million in 2007, annual O&M costs are expected to increase very gradually to $65.2 million in 2030 (2006 dollars). This is a total increase of 4.3 percent over the 24-year period in real terms. The O&M cost outlook is shown in Figure 1-2.

In contrast to the *2001 Water System Plan,* increases in O&M costs for the treatment plants are now included in the base. In addition, O&M costs related to the Tacoma Second Supply Project have been removed since SPU is no longer participating in that project.

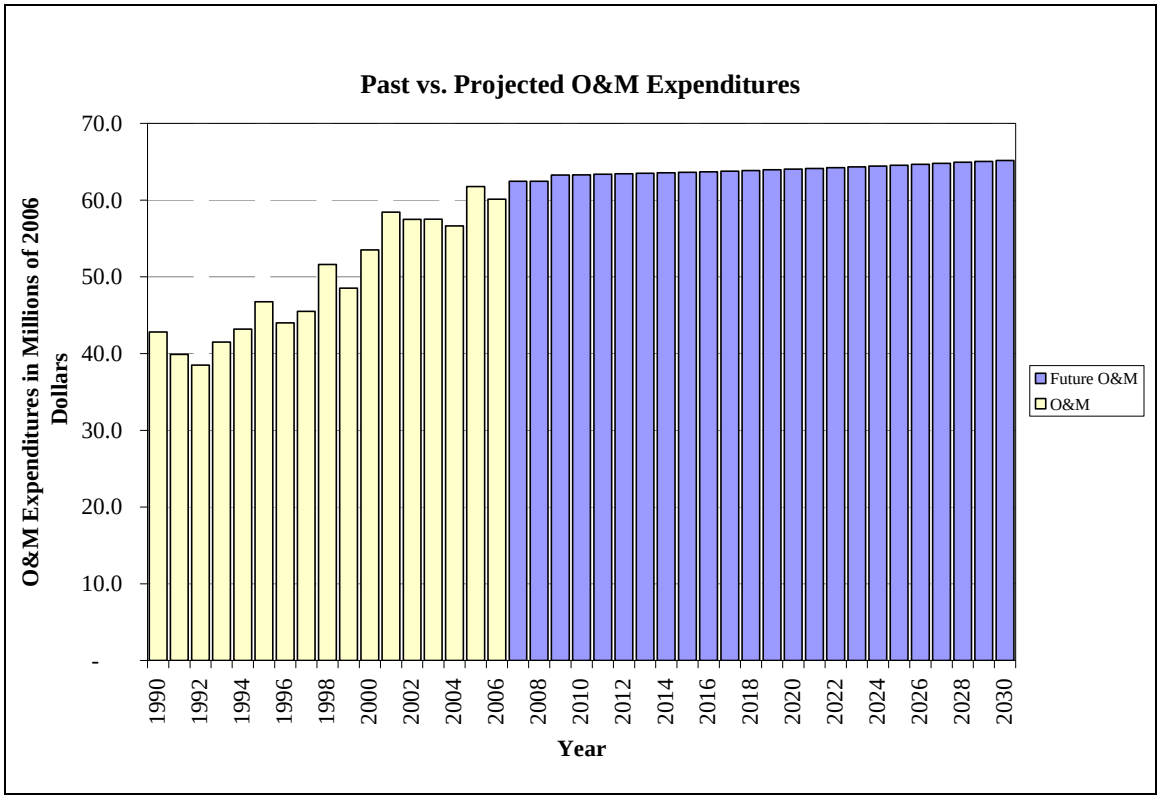


Figure 1-2. 30-Year O&M Budget Outlook